



# European Soil Visual Assessment – Field Guide

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## Principles and Purposes of Visual Soil Assessment

Visual Soil Assessment (**VSA**) is the direct evaluation of those soil properties which are visible by the naked eye and can be evaluated directly in the field. Basically, soil properties depend on texture and soil type.

**VSA can be used as a support tool for:**

- Soil survey
- Soil quality assessment
- Soil condition evaluation
- Decision making regarding soil use
- Soil protection

Plant cover, as well as individual plant quality, are supporting tools known as plant indicators for certain soil properties, quality and threat evaluation.

## Main reasons to use VSA

### Why

**VSA** is a direct and quick method for soil properties evaluation which allows the surveyor to make many repetitions throughout the year. **VSA** can be used for the investigation of the upper horizon (mainly humus horizon) or for the evaluation of the entire soil profile. In the case of the humus horizon, the expected duration of the assessment is approximately 20 minutes.

### When

The optimal time for **VSA** is when the soil has a balanced moisture content. When the soil is very dry or too moist the results of any soil assessment tends to be less representative (worse) than the actual situation. The best period for **VSA** use is late spring when the majority of European soils are in a balanced status according to soil moisture content.

### Where

**VSA** is suitable either for agricultural or natural soil. **VSA** can be used for the investigation of several soil threats, particularly soil erosion and compaction but this tool has limited suitability for polluted soil. **VSA** does not provide sufficient results for the definition and treatment of the extent of the contamination.

### Who

**VSA** can be used by farmers for a rapid check of soil suitability for cultivation or evaluation of soil status during or after certain type of cultivation and crop rotation. **VSA** estimates parameters connected directly with soil fertility, such as texture, compaction, erosion... or parameters connected more with other soil functions, like soil structure.

**VSA** can be used by soil scientists for the description of soil profiles.

**VSA** can be used by environmentalists for the investigation of certain soil threats and

**VSA** can be used by students dealing with soil science as tool for practical investigations of soil properties.

## Parameters of Main soil quality indicators

- Soil texture and stoniness
- Soil structure, agronomically valuable structure (shape of soil aggregates)
- Degree of clod development
- Soil moisture and consistency
- Soil porosity, bio-porosity
- Soil depth, thickness of humus horizon and effective soil depth
- Presence and percentage of soil wetting, water stagnation on soil surface
- Soil hydrophobicity – water repellence
- Depth of groundwater table
- Crust and cracks formation
- Soil colour, estimation of humus content
- Number and colour of soil mottles
- Estimation of soil pH, plant requirements
- Presence of carbonates, depletion of carbonates by plants
- Estimation of soil properties from parent material
- Root development, rooting depth, obstacle to root development
- Biological activity, number of earthworms and the depth of occurrence

## Evaluation purposes and procedure

### Main purposes of evaluation:

- Soil suitability for cultivation
- Soil status before, during or after cultivation
- Soil suitability for agricultural use in general
- Estimation of soil balance with surrounding environment
- Estimation of soil vulnerability according to different threats

### Evaluation procedure

All parameters have the same value, which can be increased for chosen parameters in specific cases (individual soil threats investigation – erosion, compaction ...).

### Evaluation scale for parameters

- 0 – unfavourable
- 1 – less favourable
- 2 – favourable
- 3 – very favourable

**Evaluated parameters** → **Main** (together 18)  
→ **Auxiliary**

### Total score for soil

- < 18 unfavorable soil conditions
- 18 – 27 less favorable
- 28 – 37 favorable
- 38 – 47 very favorable
- 48 – 54 optimal